dence to hand at present is that the former bird inhabits the mountains of the interior of Japan, whilst the *Accentor* may be only *A. rubidus*, but it is at least well to say so. Then again the recent work of Mr. Ogilvie-Grant on *Platalea* and *Turnix* was worth a little consideration. The nomenclature proposed for the latter genus is not adopted, and in spite of the large series of measurements given by Mr. Grant to show that the Eastern race of the common Spoonbill has a longer bill than the Western race, Mr. Seebohm states that he has been "unable to find the slightest evidence of the truth of this statement," a mode of criticism more forcible than exact. We might also ask the author why he persists in calling the Woodcock, *Scolopax rusticola* instead of *S. rusticula*, and the Wild Duck, *Anas boschas* instead of *A. boscas?* Also why does he misspell Linnæus's name throughout the work? Mr. Seebohm has, however, his own ideas as to the fitness of things, and he is in many respects too ultra-conservative for us to hope that our criticism will move him. Otherwise we might ask what is the use of *Eurhinorhynchus* having its spoon-shaped bill, if it is to be merged in the genus *Tringa?* Again, to merge so many species under the genus *Picus*, and again under *Fringilla*, which most of us consider to belong to recognizable genera, tends to fog and confuse the ideas of geographical distribution, and by no means simplifies the study, as Mr. Seebohm would have us believe.

We may add that the work is illustrated by figures from the author's work on the *Charadoiidæ*, but a large number of new cuts are added, which increase the utility of the diagnoses in the classificatory part of the work.

R. Bowdler Sharpe.

JEANS'S "WATERWAYS AND WATER TRANSPORT."

Waterways and Water Transport. By J. Stephen Jeans, M.R.I., F.S.S. (London and New York: E. and F. N. Spon, 1890.)

THIS volume is intended to give a description of the waterways of the world and water transport, and more particularly means of transport by artificial waterways. Under the heading of "The Transportation Problem," the author deals with the vast improvements made during recent years in roads, both ordinary and rail, and with the great advancement of trade caused by better means of transport during the last hundred years. He shows that, although canals may be considered as belonging to a bygone day, they are now coming again into prominence as a cheap means of transport, and that probably they will in many cases be made the nucleus of a new and better system, under which the great inland towns of Lancashire, Staffordshire, and Yorkshire may practically become maritime places. Chapters ii., iii., and iv. deal with the English river and canal system, and the waterways of Scotland and Ireland, giving an historical account, and showing how most of them in many ways have grown and improved. Readers of this volume will be surprised no doubt at the network of canals in this country: one is accustomed to think of railways as the only means of transport, and to forget the really large traffic carried by canals in many counties. The author tells us of the many continuous lines of water communication between different commercial centres of importance in England, and points out how often it happens that the through routes are rendered useless for really large boats, owing to the locks being shorter or narrower on one section than on another—thus allowing the smallest lock to be the gauge of the boat—down to the very low maximum of twenty-four tons on the canal system between the Derbyshire district and London.

On projected canals the author has much of course to say. The Manchester Ship Canal, which has attracted so much attention, no doubt has been the cause of many similar projects. The Forth and Clyde Canal is designed to enable vessels of considerable tonnage to pass from sea to sea, the present waterway being too contracted to be of much use. The Sheffield and Goole Canal is projected to form an improvement on the present navigation, to enable barges carrying 700 tons, and small sea-going steamers carrying 300 to 400 tons, to come to Sheffield for cargoes, and to serve the South Yorkshire collieries. The proposed waterways from Birmingham to the sea are now being considered in that district. In short, the present tendency seems to be to bring the ship to the manufactory, and thus save the railway charges to the coast for the carriage of the manufactured article.

The book is divided into three sections, the first of which concludes with a good detailed description of the waterways of different countries. Holland, the land of dykes and ditches, appears to have a splendid system of water communication, and the United States has received ample notice at the hands of the author. The waterways of British India are described, and the question of canals *versus* railways in that country is discussed. The author says that "Sir Arthur Cotton has even advocated the summary and indefinite suspension of nearly all railway schemes and works, in order that the attention of the Government might be concentrated upon canals, mainly for irrigation, but also adapted for purposes of navigation." This is all very well from the canal point of view, but it would be interesting to calculate the capacity of canals capable of contending with the present traffic on the railways, excluding any military questions from the subject; and in case of the famine railways, *i.e.* railways built to distribute food as a primary reason for their existence, and where quickness of delivery becomes the all-important consideration, the comparison becomes absurd. Much important work has, however, been done in India by an extensive system of artificial waterways serving the dual purpose of irrigation and navigation, and by careful superintendence the country is greatly improved and enriched by their use.

Section II. of the volume treats of the important subject of ship canals. The greatest artificial waterway constructed up to the present time has been the Suez Canal, and this monument of engineering skill is very properly dealt with first in this section. It is interesting to note that some of the earliest canals recorded were constructed between Suez and the Nile, and these were for some reason allowed to fall into decay. The author gives an excellent account of the construction of the Suez Canal; the political and monetary difficulties encountered by M. de Lesseps in the early days of the company are explained; and the ultimate completion and enormous growth of traffic through the canal are well described. On p. 208, we

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are told that "vessels of nearly 200 feet in *width* propel themselves through the canal." This must be a misprint.

Of the Panama Canal we find a good descriptive account. The many early surveys made to locate the best course for such a project are described, and it is interesting to note that as early as the year 1588 the proposal to construct such a canal is recorded. The floating of the original company, the commencement of the works, and the ultimate complete failure of these works, are well described by the author. Everything appears to have happened to seriously hamper the work on every side: political strife on the isthmus delayed the work; an act of incendiarism destroyed a number of buildings erected for the purpose of the canal; and the heavy mortality among the *employés* obtained an unenviable notoriety, and rendered the supply of good men uncertain. Bad as these events proved, the real reason for the ultimate failure of this undertaking must ever be ascribed to the insufficient data obtained of the country and of its geological formation by the company's engineers; the original estimates have proved to be understated and entirely wrong, and the many engineering difficulties must have been practically overlooked.

The Report of the Special Commission appointed in 1889 to inquire into the affairs of the company was published in May, and describes in detail the position of the undertaking. It is estimated that some 30 millions will be required to finish it, so that its ultimate construction does not appear very probable.

The projected Nicaraguan Canal, a purely American project, is also described. The author says:—"The distance from ocean to ocean by the route that has recently received the approval of the United States Government, and is now in course of apparent realization, is 169·8 miles. Of actual canal there will be 40·3 miles, the remaining 129·5 miles being free navigation through Lake Nicaragua, the Rio San Juan, and the valley of the Rio San Francisco."

Chapter xxiii. brings us home again, and deals with the Manchester Ship Canal, a monument of engineering now fast reaching completion. From the excellent description given of these works the reader will obtain a good idea of the undertaking generally.

Chapter xxiv. commences Section III., and deals with the transport problem with special reference to railways and canals. The question of railways *versus* canals is here discussed, and the steady decline of canal navigation from the date of the commencement of railway competition is pointed out. The author says that at that time, "one by one, canals dropped out of the race, and were bought up by the railway companies, either with a view to getting rid of competition, and so securing absolute control over the traffic, or in order to make way for new railway lines." Curiously enough, the *Engineer* of the 3rd inst., in a leading article on this subject, illustrates the above quotation by a reference to the Sheffield Canal, which has been allowed by the present owners—the Manchester, Sheffield, and Lincolnshire Railway Company—to silt up and become nearly useless.

The railways in this and other countries are getting to be considered gross monopolies, and the improvements in the canal navigations are being looked upon as a means of relief. The Manchester Ship Canal is the firstfruits of this feeling on the part of traders and manufacturers, and other ship canals are being talked of.

On the comparative cost of water and land transport the author has much to say. In discussing the relative cost of carriage in the States and in this country, we must not forget that the capital charges per mile on open lines in this country cannot fairly be compared with those in the States, for the reason that the land was in the first instance bought from landowners anxious to obtain the largest sum; the average station buildings and fixed plant are of a far more expensive description; and the kind of traffic carried is of a different type.

The railways in the United States appear to be able to carry goods at a remarkably low rate, no doubt severe competition for the traffic being the reason; at the same time, excluding capital charges and the like, the amount of coal burnt per ton mile in this country is far below that used by the American locomotives.

If traffic is to be moved from town to town at the cheapest rate, it is necessary that it shall be moved in large masses, or trains. It is on this account that the American traffic can be transported by railway cheaper than in this country: were it possible in England to obtain a steady through traffic in any large volume, the weight of trains hauled would certainly increase, and the rates would probably drop in proportion. Canals, when properly managed and with proper appliances, ought to carry heavy traffic with the same regularity as the railways; but as long as they are controlled by the railway companies, they are, in the nature of things, bound to decay and become a secondary means of transport.

The author explains in chapter xxviii. various mechanical means of haulage in vogue at the present time, and then goes on to deal with locks, planes, sluice-gates, and the like. The volume concludes with a chapter on the acquisition by the State of the waterways. The subject is handled in a masterly manner. In this book we have a large amount of information put together in a readable form, and no doubt it will prove very useful to those interested in a very important subject.

N. J. L.

SANITY AND INSANITY.

Sanity and Insanity. By Charles Mercier, M.B., Lecturer on Insanity at the Westminster Hospital Medical School, and at the Medical School for Women. The Contemporary Science Series. (London: Walter Scott, 1890.)

TO bring the facts of any department of knowledge before the non-scientific in an easily assimilable form, without offence to the good taste of some one or other section of the community, is by no means so simple a matter as the prolific literature of this class in late years might seem to indicate. It is not every author or lecturer, however able as a man of science, who can thus cater satisfactorily for an omnivorous, but captious and critical public. Every mechanics' institute and popular lecture-room exemplifies this truth—the enthusiasm of the aspirant to public honours in this field is often inversely proportional to his qualifications and actual attainments. The first requisite condition is that the author be

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